REMARKS

The specification has been amended and new claims 2-12 have been added. Claims 1-12 are pending, with claims 1-2 and 7-8 being independent.

Attached hereto is an Appendix entitled "Version with Markings to Show Changes Made" which is a marked-up version of the portions of the application which have been amended by the present amendment, with brackets indicating deleted matter, double underlining indicating added matter, and single underlining indicating existing matter which is to be underlined in the printed patent.

A claim for priority was filed on June 25, 2001, and it is respectfully requested that the claim for priority be acknowledged.

An Information Disclosure Statement was filed on June 25, 2001, and it is respectfully requested that the Information Disclosure Statement be considered.

Preliminary remarks were filed on June 25, 2001, and it is respectfully requested that the preliminary remarks be considered.

New claim 7 is a method claim corresponding to apparatus claim 1. It is submitted that claim 7 is allowable over the prior art for substantially the same reasons that claim 1 is allowable over the prior art as discussed in the preliminary remarks of June 25, 2001, and an indication to that effect is respectfully requested.

Please charge any shortage in fees due in connection with the filing of this paper, or credit any overpayment of fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (500.36707CX1).

Respectfully submitted,

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Attachment

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

Changes made to the application by the present preliminary amendment are indicated below, with brackets indicating deleted matter, double underlining indicating added matter, and single underlining indicating existing matter which is to be underlined in the printed patent.

IN THE SPECIFICATION

The paragraph on page 4, line 25, through page 5, line 27, has been deleted and replaced with the following replacement paragraph:

--In recent years, other various signal processing systems for higher-density recording have been discussed in addition to the above-described conventional apparatus. As a powerful one of those systems, there is a [list] List Viterbi [algorithm] Algorithm (hereinafter referred to as an LVA). In this system, the Viterbi detector 210 detects the most reliable data sequence (best sequence), the second most reliable data sequence (2nd best sequence), the third most reliable data sequence (3rd best sequence), ... , and the nth most reliable data sequence (nth best sequence), produces these as proposed sequences, or candidates, detects a decoding error of each candidate by use of CRC (Cyclic Redundancy

Check) or the like, and generates a decoded output of candidates with no decoding error. The LVA is able to greatly improve the decoding error characteristic of the Viterbi detector. The details of the LVA are described in N. Seshadri et al., "List Viterbi Decoding Algorithms with Applications", IEEE Transactions on Communications, Vol. 42, No. 2/3/4, February/March/April 1994, pp. 313-323. The LVA was originally contrived for application to a communications field such as mobile radio communication, but it has not yet been applied to a magnetic recording/reproducing apparatus. The present invention fundamentally applies the LVA to a magnetic recording/reproducing apparatus as will be described later with respect to various embodiments. However, a simple application of the conventional idea directly to the apparatus cannot achieve high-density recording. This will be described in detail later.--

The paragraph on page 14, line 14, through page 15, line 24, has been deleted and replaced with the following replacement paragraph:

--Fig. 1 shows the system structure of a digital magnetic recording/reproducing apparatus according to the invention. Referring to Fig. 1, on the recording side, a recording coder 101 converts an input information sequence of 0, 1 of digital data into a high rate code of R=16/17. The recording code, as well known, limits the number of successive 0s to a definite

number, thereby preventing the timing extraction and gain control (not shown in Fig. 1) of the reproducing side from being reduced in their performances. The recording coded sequence is then coded for error detection by a CRC coder 102. The CRC can be achieved using a block code produced by adding error detection check bits to the recording coded sequence. Here, the coded sequence is constructed by blocks of much longer CRC block length (more than about 100 bits) so that the substantial coding rate after CRC coding becomes [more than] 8/9 <u>or more</u> for high-density recording. If, for example, CRC check bits of 8 bits are added to every 8 units each of which is composed of 17 bits after 16/17 code conversion, the CRC block length is 8 units + 8 bits, or 144 bits, and the coding rate becomes 128/144, or 8/9 as a whole. Thus, the above CRC block structure is able to detect an arbitrary error of, for example, up to 2 bits. Errors can be limited to 2 bits or less by the provision of a precoder 103. The precoder 103 converts the CRC coded sequence into a code using $1/(1 + D^2)$ as a transfer function. Here, D is the delay operator that provides a delay time equal to the distance between bits. The precoder 103 and reproducing-side postcoders 112 can suppress the decoded error propagation length after Viterbi detection to a definite value. Therefore, the CRC can detect on the reproducing side all error patterns that have been limited to a definite length by the above means. The precoded sequence is supplied through an amplifier 104 to a record head 105 by

which it is recorded as magnetic information on a magnetic recording medium 106.--

IN THE CLAIMS

New claims 2-12 have been added.